

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (*Currently Amended*) A current sense circuit, comprising:
 - a shunt resistor in a current path for measuring current in the current path;
 - a sense resistor coupled to the shunt resistor for dividing current supplied to the shunt resistor;
 - a voltage buffer disposed between the shunt resistor and the sense resistor; and
 - a biasing voltage in the voltage buffer;
 - wherein a resistance value for the sense resistor ~~being selectable~~ is selected based on a range of current in the current path, such that a ratio of the a shunt resistor value to the and the selected sense resistor value produces establishing a desired gain relationship suitable for establishing a range of current measurements to cover a range of sensed current;
 - wherein the biasing voltage produces a reference current value through the sense resistor such that a sensed current through the sense resistor comprises both the divided current from the current path and the reference current value;
 - wherein a measurement of the divided current through the sense resistor is obtained by subtracting the reference current value from the sensed current; and
 - wherein a current flowing through the shunt resistor is determined based on the obtained divided current through the sense resistor and the gain relationship.
2. (*Canceled*).
3. (*Currently Amended*) The circuit according to claim 2 1, wherein the current direction through the sense ~~resistant~~ resistor is constant.
4. (*Canceled*).
5. (*Original*) The circuit according to claim 1, where at least one of the shunt and sense resistors is selected to obtain a ratio of thermal coefficients for the resistors that is approximately 1.0.

6. (Canceled).

7. (Currently Amended) The circuit according to claim 6 1, ~~further comprising a reference current storage element coupled to the sense resistor for storing wherein~~ the reference current value is stored.

8. (Withdrawn) A current sense circuit, comprising:
a shunt resistor in a wire for measuring current through the wire;
a sense resistor coupled to the shunt resistor to provide a current divider path for the sensed current;
a switch disposed between the shunt resistor and the sense resistor for decoupling the sense resistor from the shunt resistor;
a voltage buffer coupled to the sense resistor and operable to maintain a single current direction through the sense resistor; and
the bias voltage being further operable to provide a reference current value in conjunction with the sense resistor when the switch is operated to decouple the sense resistor from the shunt resistor.

9. (Withdrawn) The circuit according to claim 8, further comprising a reference current storage element for storing the reference current obtained when the switch is operated to decouple the sense resistor from the shunt resistor.

10. (Withdrawn) The circuit according to claim 9, further comprising a summing element coupled to the storage element and operable to subtract the reference current value stored in the storage element from a sensed current value through the sense resistor when the switch is operated to couple the sense resistor to the shunt resistor.

11. (Withdrawn) The circuit according to claim 8, further comprising a specified relationship between the values of the shunt resistor and the sense resistor to obtain a specified gain and dynamic range for measuring a current through the shunt resistor.

12. (*Withdrawn*) A current sense circuit, comprising:
a shunt resistor connected to a wire for measuring current through the wire;
a sense resistor coupled to the shunt resistor to provide a current divider circuit;
a relationship between the shunt resistor and the sense resistor values to provide a specified gain and dynamic range for measuring current through the shunt resistor; and
a trimming mechanism coupled to the sense resistor to modify the value of the sense resistor to obtain the specified gain in relationship with the shunt resistor value.

13. (*Withdrawn*) The circuit according to claim 12, wherein the trimming mechanism is a network of resistors, individual connections of which are interruptible to modify the overall resistance of the sense resistor.

14. (*Currently Amended*) A method for sensing current in a wire, comprising:
providing a shunt resistor in the wire to generate a voltage related to the current through the wire;
providing a sense resistor coupled to the shunt resistor to obtain a current divider circuit, wherein a resistance value for the sense resistor is selected based on a range of current in the wire, the shunt resistor and the sense resistor establishing a desired relationship;
applying a biasing voltage between the shunt resistor and the sense resistor, the biasing voltage producing a reference current value through the sense resistor;
measuring current flow through the sense resistor, the measured current flow comprising both divided current from the wire and the reference current value;
subtracting the reference current value from the measured current flow through the sense resistor to obtain a measurement of the divided current through the sense resistor; and
determining current flowing through the shunt resistor based on a specified the obtained divided current through the sense resistor and the desired relationship between the shunt resistor and the sense resistor.

15. (*Currently Amended*) The method according to claim 14, ~~further comprising~~ establishing wherein the relationship between the shunt resistor and the sense resistor is based on a desired gain ratio between the shunt resistor value and the sense resistor value.

16. (*Currently Amended*) The method according to claim 14, ~~further comprising applying a wherein the~~ biasing voltage ~~between the shunt resistor and the sense resistor such that~~ causes current flows to flow through the sense resistor in one direction.

17. (*Withdrawn*) A method for measuring current in a wire, comprising:
providing a shunt resistor in the wire to develop a voltage for measuring current through the wire;
providing a sense resistor coupled to the shunt resistor to obtain a current divider circuit;
providing a switch between the shunt resistor and the sense resistor to couple or decouple the sense resistor and the shunt resistor; and
obtaining a reference current through the sense resistor when the sense resistor is decoupled from the shunt resistor.

18. (*Withdrawn*) The method according to claim 17, further comprising storing the reference current.

19. (*Withdrawn*) The method according to claim 17, further comprising:
operating the switch to couple the sense resistor and the shunt resistor; and
determining a value for current flowing through the shunt resistor based on current flowing in the sense resistor and the reference current.

20. (*Canceled*).

21. (*Canceled*).

22. (*Withdrawn*) A method for setting a gain relationship between a shunt resistor in a wire for measuring current through the wire and a sense resistor coupled to the shunt resistor to form a current divider circuit, the method comprising:

passing a predetermined current through the shunt resistor and the sense resistor;
obtaining a current measure for the current flowing through the sense resistor;

determining an error percentage based on an expected value for the current measured in the sense resistor and the actually measured current through the sense resistor; and

adjusting the value of the sense resistor to reduce a difference between the expected value of the current and the actually measured current through the sense resistor.

23. (*Withdrawn*) The method according to claim 22, further comprising determining an adjustment to the sense resistor based on the difference between the expected current value and the actually measured current value.

24. (*Withdrawn*) The method according to claim 23, wherein determining an adjustment further comprises obtaining adjustment parameters for the sense resistor from a look-up table.

25. (*Withdrawn*) The method according to claim 22, further comprising measuring current through the sense resistor a second time and comparing the measured current with an expected current value to determine an error percentage.

26. (*Withdrawn*) The method according to claim 25, further comprising ensuring a difference between the second current measurement and the expected value of the second current measurement fall within specified error ranges related to the adjustment to the sense resistor.

27. (*Withdrawn*) A method for forming a look-up table of values related to configuration of an adjustable sense resistor for use in conjunction with a current shunt resistor for measuring current in a wire, the method comprising:

providing values for resistors in resistor path configurations for a resistor network forming the sense resistor;

simulating selected interruptions in the resistor network to produce a percent change in overall resistance for the sense resistor;

storing the selected interruption configuration and the associated percent change; and

providing a list of the interruption configurations and the associated percent changes.